Amendments to the Specification:

Attached to this document is a substitute specification. The specification has been amended to add a new cross-reference to related application section, to add paragraph numbers and to delete line numbers.

Please add the following new paragraphs at the beginning of the application:

CROSS-REFERENCE TO RELATED APPLICATION.

This application is a continuation of U.S. Serial No. 09/651,821 filed on August 30, 2000 by inventor Melanson (Attorney Docket No. 1067-CA).

This application is also related to U.S. Patent No. 5,815,102 issued on September 29, 1998 by inventor Melanson, and is incorporated herein by reference.

Please amend page 8, line 23 of the original specification as follows:

frequencies for driving digital PWM controller 204 ~~ramp generator 205~~.

The specification has also been amended to explicitly include a portion of the subject matter of co-assigned U.S. patent No. 5,815,106. Please insert the following new paragraphs after Line 4 on Page 9, as new paragraphs 0029 through 0031:

As described in detail in U.S. Patent 5, 815, 102, PWM controller 204 includes a delta-sigma modulator which quantizes the audio input stream and a duty cycle modulator which converts the resulting noise shaped quantized data stream into a duty-cycle encoded (pulse width modulated) data stream. A number of exemplary encoding schemes are described, including grow-left, grow-right, centered-grow-left, and centered-grow-right.

As shown in FIGURE 2 herein, the divide ratio between the higher frequency clock signal output directly from oscillator 206 and the lower frequency clock signal output from divider 209 controls the operating behavior of PWM controller 204. Again, a change in the divide ratio changes the number of clock periods (slots) per PWM pattern output from PWM controller 204, and consequently changes the switching frequency of output transistors 201 a -201 d. Additionally, when the number of slots per PWM output pattern changes, the output pulse width representing the zero (0) input point also changes. For example, for a PWM output

pattern having from 0 to 64 slots representing an input signal swinging between a maximum negative value and a maximum positive value, a PWM output pattern with zero (0) logic high slots (i.e. a zero percent duty cycle) represents the maximum negative input value, a PWM output pattern of 64 logic high slots (i.e. a one hundred percent duty cycle) represents the maximum positive input value, and a PWM output pattern with 32 logic high slots (i.e. a fifty percent duty cycle) represents an input value of zero (0). On the other hand, if the divide ratio changes to 7 2, and each PWM output pattern becomes 7 2 slots wide, then a PWM pattern with zero logic high slots represents the maximum negative input value, a PWM output pattern with 36 logic high slots represents an input value of zero, and a PWM output pattern of 72 logic high slots represents the maximum negative input value. In other words, while theoutput duty cycle for the zero input point remains constant at fifty – percent (50%) as the number of slots per output pattern changes, the number of active slots representing the zero input point does change.

Also described detail in U.S. Patent 5, 815, 102 are techniques for compensating for the moving center gravity of a PWM signal being generated by PWM controller 209. Generally, the area under the output curve (i.e. the first integral) of a stream of PWM output patterns is directly proportional to the input stream, for either grow - right, grow - left, centered – grow – left or centered – grow - right patterns. However, the second integral of the curve representing that PWM output pattern stream (i.e. the center of gravity) shifts with changes in the input value stream, thereby introducing distortion. U.S. Patent 5, 815, 102 provides a means for compensating for such second-order distortion in the PWM output with non-linear feedback to the delta –sigma modulator within PWM controller 204.

No new matter has been added to the specification. These amendments have been added to further define and explain the invention.